microemboli was significantly higher in CAS group than CEA group (46.3% and 12% respectively, P<0.05) despite a relative low incidence of associated neurologic symptoms (2.6 % vs. 2%). Thirty patients (16 CAS and 14 CEA) with 50 DWI lesions (mean size 46.57mm^2, ranging 16 to 128mm^2) were further analyzed. During a mean MRI follow-up of 10 months (range, 2 to 23 months), residual MRI abnormalities were only identified in DWI lesions larger than 60mm^2 (n=5, P<0.001). CEA group had fewer but larger ipsilaterally distributed emboli (total 12 lesions, mean 79mm^2) comparing to CAS group (total 38 lesions, mean 27.5mm^2, P<0.05). Regression analyses of 68 CAS patients (mean age 71 years, range, 53-91 years) showed that date of procedure prior to 1/2007, coronary artery disease, diabetes, and perioperative troponin elevation were significant predictors of microemboli (P<0.03). Date of procedure was the only predictor of bilateral hemispheres microemboli (p=0.025).

Conclusions: Carotid interventions are associated with significant DWI lesions despite absence of clinical symptoms. Risks of microemboli correlate to physician experience and patient selection. Larger DWI lesions (>60mm^2) can lead to long-term residual structure abnormalities that warrants further neurocognitive evaluation.

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RR7.

Treatment Strategies of Arterial Steal After Arterio-Venous (AV) Access

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Objectives: Ischemic steal (IS) associated with an AV access is rare, but can result in severe complications. Multiple techniques have been described to treat IS with varying degrees of success. This study compares these options.

Methods: Patients with IS from June 2003 to August 2008 were reviewed. Demographics, type of AV access, management technique and success of intervention were recorded. Success was defined as resolution of IS symptoms while preserving access function. Further, 100 consecutive AV access procedures were reviewed for current practice patterns. We analyzed data using z- and chi-squared tests. The study was approved by our IRB.

Results: A total of 114 patients with IS had a mean age of 65 years (range 20-90) and were predominantly female (66%), diabetic (61%), and had proximal brachio-cephalic or brachio-basilic fistulas (69%). Women were noted to have a brachial artery origin more frequently than men (OR 3.1, p=0.009) in current practice. Forty-four mild cases were observed uneventfully. Results of 87 interventions on 70 patients are in Table I. Of these, 31 early procedures (<30 days from index fistula) were mostly ligation (42%) or banding (45%) while Distal Revascularization, Interval Ligation (DRIL) was the most frequent choice for late interventions (38%). DRIL had a better success rate than banding ($p \leq 0.05$). Of the 11 patients requiring repeat intervention, the majority had failed banding procedures (73%). In our current practice, 18% of patients had an AV fistula with the proximal radial artery (PRA) as the inflow source, while this type of fistula accounted for only 2% of all IS patients. Ligation resolved symptoms in all patients, but the AV access was lost.

Conclusions: Among various options to treat IS, banding has a low success rate and high likelihood for re-intervention, while DRIL is particularly effective, though not uniformly. Women have more IS probably because they frequently have more proximal access. Use of the PRA as the inflow source may decrease the incidence of IS.

Success of management techniques

Management technique	*N*	*Follow-up*	*Success (95% CI)*
Ligation	27	25	0% (NA)
Banding	22	21	38% (17% - 59%)
DRIL	21	20	80% (62% - 98%)*
Improve inflow	9	7	43% (NA)
Revision using distal inflow (RUDI)	4	3	100% (NA)
Proximalization of arterial inflow (PAI)	3	3	100% (NA)
Distal revascularization	1	1	100% (NA)

*Statistically significant at p=0.05.

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RR8.

Predicted Shortage of Vascular Surgeons in the United States: Population and Workload Analysis.

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Objective: To estimate the size of the future workforce in Vascular Surgery (VS) and the added cost associated with addressing the projected shortage in the United States.

Methods: The net supply (number of VS currently practicing, new graduates entering the workforce and those retiring) for each decade was calculated. The projected population for each decade was determined by US Census Bureau figures. Some of the assumptions included: (1) In 2008 the population was 300,000,000; 2) There were 2783 board certified VS in 2008; (3) VS will practice 30 years from board certification to retirement; (4) there will be 105 board certifications and 93 retirements a year; (5) Vascular operations will remain at 284 per 100,000 population and (6) Salaries of trainees will be $50,000 with benefits of 30%, and $ 15,000 of additional DME costs.

Results:

Population Analysis:

Year	*Projected population*	*Vascular surgeons needed*	*Vascular surgeons in practice*	*Shortage*	*% Shortage*
2000	282,000,000				
2010	309,000,000	2,866	2,807	59	2.1%
2020	336,000,000	3,117	2,927	190	6.1%
2030	364,000,000	3,377	3,047	330	9.8%
2040	392,000,000	3,636	3,150	486	13.4%
2050	420,000,000	3,896	3,150	746	19.2%

Workload Analysis

Year	*Projected population*	*Estimated work load for population*	*Vascular surgeons needed*	*Vascular surgeons in practice*	*Shortage*	*Percent shortage*
2000	282,000,000					
2010	309,000,000	877,560	4,112	2,807	1,305	31.7%
2020	336,000,000	954,240	4,472	2,927	1,545	34.5%
2030	364,000,000	1,033,760	4,844	3,047	1,797	37.1%
2040	392,000,000	1,113,280	5,217	3,150	2,067	39.6%
2050	420,000,000	1,192,800	5,590	3,150	2,440	43.6%

Conclusions: A conservative estimate by both population and workload analysis, disregarding ageing of the population, lifestyle choices of future VS and increasing demand for services, indicates a shortage of VS in the future. The cost of training enough VS surgeons by 2030 will be between $1,166,400,000 and $2,182,320,000.Unless the Balanced Budget Act of 1997 is revised by Congress, the cost to train the additional VS remains a significant barrier.

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RR9.

Midterm Postoperative Surveillance of EVAR and Endoleak Prediction Using SAC Pressure and Volume Monitoring

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Objective: To evaluate the utility of aneurysm sac pressure and aneurysm volume monitoring for EVAR surveillance.